JUNE 2, 1964 WIND heading WEST
sky PARTIALLY ~~cloudy~~ cloudy

0725			Began watch	
0740	2	SE	Sooty tern	
0741	1	SW	W.T. Shearwater	
0743	1	E	Sooty tern	
0750	1	S	Pterodroma Sp? white underbottom dark on top	Bird heading straight out east south, always gliding, crash gliding
0755	20± 5	SW	Sooty tern flock	
0755	1	S	Pterodroma Sp. dark on top white underbottom	
0805	90± 20	S	Sooty tern — flock feeding	
0805	20± 5	S	W.T.S. — flock "	
0805 ↕ 0810	9	S	seen scattered	
0811	2	S	W.T.S.	
0820	2	—	bird sp?	
0825	1	NE	dark phase W.T.S.	
0830	1	?	W.T. Tropic bird	
0834	1	NE	Sp?	
0835	1	NE	W.T.S.	
0845	2	NW	Newells shearwater	
0902	1	NW	Bulwers Petrel	
0906	1	SW	Pterodroma Sp?	poss. W.T.S
0905	1	SW	Bulwers petrel.	
0941	1	/	Pterodroma Sp?	
0950	1	NW	Pterodroma Sp?	
10:11	1	NW	Newells shearwater	
10:13	2	—	Bulwers Petrel. — sitting on water	
10:16	1	N	" "	
10:21	3	N	W.T. Tropicbird 1 flying 2 on water	

June 2 Wind E from E

1025,	2	E	Lesser frigate Ad. Male 1 imm.
1053	1	N	W.T.S White phase
1104	1	E	Frigate
1113	1	E	Frigate
1130	1		Bulwers Petrel ~~of~~ ashy storm-petrel
1137	1	N	Pterodroma sp.
1145	1	N	Fairy tern
1205	1	N	W.T. Tropicbird
1205	1	SW	Bulwers petrel
1215	1	S	Bulwer's Petrel
1216	3	E	Bulwer's Petrel
1227	1	S	Bulwer's Petrel
1235	1	S	Bulwer's Petrel
1235	1	S	Wedge-tail (light phase)
1242	1	S	Wedge-tail (light phase)
1250	1	SE	W.T. Tropicbird
1250	1	S	Bulwer's Petrel
1305	1	N	Bulwer's Petrel
1306	1	S	Wedge-tail (light phase)
1313	1	S	Pterodroma
1315	2	S	Bulwer's [redacted] Petrel
1320	1	S	Pterodroma
1325	1	S	Bulwers Petrel
1329	2	S	Sooty tern
1330	1		Sooty tern
1332	2	E	Sooty tern
1335	1	S	W.T.S.

June 2

1415	2	N	W.T.S.
1420	1	NW	Sooty tern
1430	1	–	Bulwers Petrel.
1440	1	W	W.T.S.
1443	1	S	Bulwer's petrel.
1446	1	–	Bird sp?
1530	2	S	Bird sp?
1557	1	N	Wedge-Tail (light phase)
1631	1	N	Wedge-Tail (dark phase)
1658	1	S	~~[illegible]~~ ? Puffinus sp
1659	1	S	~~[illegible]~~ ? Puffinus sp
1659	1	W	Bulwer's Petrel
1735	1	S	Wedgetail Shearwater
1740	~~1~~	→	Large Feeding Flock
	25-40		Sooty terns
	17-25		Wedge tails
1800	—		Closed observations —

Wind: easterly 10-15 mph, clouds: 10 coverage. sea moderate

June 3

07:40			start observations
7:42	1 ~~W~~	W	large Shearwater-P. white below dark above
7:55	1	N	~~W~~ Kermadec Petrel ↗ ? ~~Petrel~~
8:05	1	E	Bulwer's Petrel
8:15	1	W	Kermadec Petrel ?
8:20	1	S	Wedge-tail Sh. - (light phase)
8:~~25~~	1	W	Bulwer's Petrel
825	1	SW	~~Newell's~~ Newell's Shearwater ??
8:40	1	W	Bird sp.
	1	W	Newell's Shearwater
8:40	1	W	Wedge-Tail (light phase)
			~~Feeding flock~~
8:45	50+	N	Sooty Tern - feeding flock
	5+	N	Puffinus sp.
8:52	1	S	Bird sp.
9:00	2	W	Puffinus sp.
0918	1	NW	Kermadec Petrel ?
0919	1	NW	Puffinus sp. black & white
0930	2	SE	Pterodroma sp.
0935	2	W	" "
0937	1	NW	Bulwer's Petrel
1004	1	S	Bulwer's petrel
1021	1	W	Puffinus sp.
1034	1	W	Kermadec Petrel ?
1036	1	W	~~Bulwer's Petrel~~
1036	1	NW	Puffinus sp.

time	number	direction	Species
1107	1	N	Puffinus sp.
1111	1	NW	Wedgetail Shearwater. ?
11:12	1	NW	Kermadec Petrel?
11:24	1	W	Audubon's Shearwater
11:45		closed	the watch
12:00		Open	watch
12:01	1	S	Audubon's Shearwater
1230	1	on water	Wedge-Tail Shearwater - flew east
1232	1	on water	" " " - flew east
1242	1	N	Bulwer's petrel
1243.	1		Bulwers petrel
1243	1		Sp? white on bottom dark on top white spot on primaries of right wing ↕ about adubon size
1244	1	N	Bulwers petrel
1300	1	N	Bulwars petrel
1304	2		Pterodroma Sp?
13 07	1	NW	Bonin is petrel ~~sh...~~
1336	1	S	Bonin is Petrel Shearwater - type
1340	1	NW	Bonin is Petrel Shearwater type some ↑
14:03	1		Petrel Shearwater ↑
14:04	1		Wedgetail Shearwater
14:10	1	NW	Audubon's Shearwater (?)
14:37	2	N	Bulwer's Petrels
14:38	1		Harcourts
1501	1	NW	Puffinus sp.
15:25	1	Shot	Bonin I. Petrel ?
15:35	1	N	Fairy Tern or Tropic Bird

June 3

1545	1	E then W	Newell's Shearwater
1555	1	SE	Newells' Shearwater
1547	20±	E	Sooty Tern
1547	2+	E	Puffins sp.
16:15	1	Shot	~~Skua~~ ~~Parasitic~~ long tailed Jaeger
Flying high, like a tern, towards East			
16:35	1	E	~~Harcourts~~ Petrel
1650	2	E	Fairy Terns
16:55	1	E	Red-tailed Tropic bird
~~1700~~	~~3+~~	feeding	Bonin Island Petrel
1708	1	SE	" " "
		Finis → ~~1718~~	1718

June 4 winds E

0745			START watch
0830	1		Bird sp?
0837	1		Bird sp
0845	1	SE	Petrel shearwater type — white EAR E ~~&~~ brown white underwing upper parts black tip to wings
0849	1	N	Bonin Is Petrel
0849	1	E	Petrel shearwater type
0850	1	S	Christmas Island S.
0850	1	N	Petrel Shearwater type
0900	1	S	SAME AS 0845 today — Audubon size slightly larger
0901	15 +2		Wedge tailed (Dark phase)
~~09~~ 09:15	1	E	Flying high Red tailed Tropic-Bird
09.20	1		Circling dead R.T. Bulwer's Petrel
1024	1		Audubon Shearwater
10 36	1		Audubon Shearwater
1048	1	N	Audubon S.
1120	1	W	medium sized petrel, white or grey head, dark patch around eye, brown back & wings then white stripe down upper surface of wing, dark white wing linings bordered with, dark black & white Petrel/Shearwater?
1123	1	SE	
11 38	2	NWN	2 Puffinus sp.
			close at 1155
1300	1	?	Bulwer's Petrel
1310	2	S	Bulwer's Petrels
1310	1	S	Bonin Is. Petrel
1323	1	SE	Bulwer's Petrel
1345	1	W	" "
1430 ±			
1500 ~	100+	NE	Wedge-tail all dark
same	5+	NE	Audubons Shearwater
same	2+	NE	Manx Shearwater

1447	1	—	Wedgetail shot.
1430 1500	10+	NE	Bonin Island Petrels
1503	4	N	Wedgetail dark
1430 1500	30+	NE	Sooty Terns
1504	12	NW	Wedgetail dark.
			" "
1512	1	W	" "
1520	2	SE	
1530	2	SE	dark blotches on Masked Booby back & wings together at all times, synchronous flapping & sailing
16:10	1	E	White Tailed Tropic Bird Folding from very high in air, goes into dive & hits water w/ splash, got E fish
16-15	1	E	White tailed tropic bird (perhaps same one) no tail, yellow bill, sitting on H2O in front of ship
1025	2	NW	Wedgetail Shearwater
1627	5	W	" " dark
1636	1	SE	Audubon's Shearwater.
1641	2	SE	Masked Booby synchronous.
1647	1	S	Bonin Island Petrel
1650	1	S	Kermadec Petrel
1650	1	E	Wedge-tail. dark
1700	25	E	" " " originally feeding but then moved off to east.
1700	2	E	Masked Boob

June 4

1717	1	N	Masked Booby
1723	5	NE	Wedgetail
1723	2	NW	Bonin Island Petrel
1725	2	NW	Bonin Island Petrel
	1 > 25		close

June 29
wind from NW
sky ¾ clouded

0810			Started watch
0940	*	20+	sooty tern
0940	NW	1	~~All white bird~~ tropicbird sp ?
0942		5	Fairy terns
1040	NW	1	Procellariform sp ? } edge of
1045	NW	2	" " } storm
1100	NW	1	Sooty tern
11.15	NW	1	Procellariform sp ? in storm
1:19	SE	1	Cook's Petrel
1:40	S	1	White-bellied Storm Petrel
1:43	NW	1	Cook's Petrel
1:45		2	Puffinus sp.
1:55	SSW	1	Bonin Island Petrel (?)
2:05	SW	1	Fairy Tern
2:05	WSW	1	Cook's Petrel
2:05	N	1	Jaeger (?) flying high, slowly circling, all dark
2:40	NW	1	large black + white Shearwater
2:43		2	Brown Noddy attempted to land on
2:43	NW	1	small black + white Shearwater
2:44	NW	1	Sooty Tern high
2:50	SE	1	small black + white Shearwater, fast flap, patterned wing.
3:00	NE	50+	Sooty Tern
3:00	NE	1	red-footed Booby
3:07	SE	1	Kermadec Petrel
3:12	NE	1	Cook's Petrel (?)
3:25	NW	2	Sooty Terns
3:25	NW	1	Noddy
3:25	NE	2	Sooty Tern

The Cooks Petrel was a medium sized Petrel with a dark cap, white forehead, white underparts, grey back, grey wings with a spectacular black W or inverted M across the wings and back. The black W was very conspicuous on the grey background. Both birds came in at close range, which afforded good looks.

The White-bellied Storm Petrel was spotted hovering, "walking" on the water 20 feet from port bow. It was entirely Sooty with a white band across the wings and white belly. Throat and upper breast were dark. The back and wings were lighter than the head & body. Back Tail shape unobserved.

0510
1720

12.5
726
154
92
1176

53/1 12.9
119 153.6
119
34.0

29 June 1964

3:35	NW	1	medium to large Petrel dk above dark chest and head, white eye patch.
~~3:40~~			
16:12		1	Procellitorme sp? (medium sized)
1637	NW	1	black + white, medium sized Petrel
1707	E	1	Phoenix Is. Petrel
			finis at 1720

June 30

Wind from Northwest, broken cloud layer, cal

0810			Startwatch
0846	E	1	Tropic bird sp?
0900	NW	1	Bird sp? poss. Sooty tern
0901	NW	1	Sooty tern
0902	NW	4+	Sooty tern
0928	NW	1	FAiry tern
0930	SE	2	Sooty tern
0935	SE	3	Sooty tern
0936		10+	Sooty tern
0940	NW	1	Sooty Tern
0956	E	1	Cook's petrel ?
0957		1	R. Tropic bird on water
0959	SE	6	Sooty terns
~~10:00~~	E	1	Cook's petrel ?
10:03	NW	5	Sooty Tern
10:07	NE	3	Sooty Tern
10:08	NE	2	Sooty Tern
10.11	SE	4	Sooty tern
1012	NW	2	Sooty tern
10:23	SE	1	dark Wedge tail.
10:30	NW	5	Sooty Tern
10:30	NE	1	Sooty Tern
10:47	S	1	Sooty Tern
10.49	W	2	Sooty Tern
10:50	NW	4	Sooty Tern
10:51	W	1	dark Red-footed Booby
10:52	NW	4	Sooty Tern
10:54	NW	1	Sooty Tern

30 June 1964

1120	S	3	Sooty Tern
1122	N	1	Sooty Tern
1130	N	1	Sooty Tern
1140	SE	1	Sooty Tern
1145	S	1	Sooty Tern
11:58	W	5	Sooty Terns
12:42	SE	2	Sooty Terns
13:15		1	W.T. Tropic
13:20	SE	2	sooty Terns.
14:07	SE	1	Sooty Tern
1515	NW	2	Red-footed Booby (dark)
1540	E	1	Tropic bird (Red-tails? White-tails?)
1615	E	1	Sooty Tern
1630	S	1	Red-footed Booby (dark)
1700			Time change
17:16			Close Watch
1650	+	1	Tropicbird species - on water
1700	SW	1	White-T. Tropicbird.

DATE 2 July 64

Time at sunrise = 0641 Position at sunrise = 169° 30'W 14° 30'S

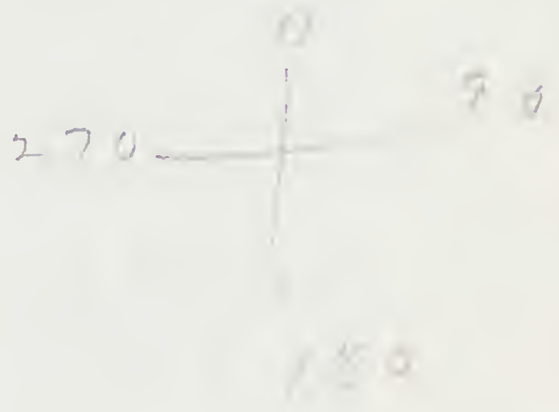
Time at sunset = 1754 Position at sunset = Aunuu Is. 14-18 170°-2

Miles traveled from 0000 hours to sunrise = 28

Miles traveled from sunrise to sunset = 53

Miles traveled from sunset to 2400 hours = 0

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.	0800	Radar & Visual	169° 44.7'W	14° 28.3'S
2.	1200	visual & Radar	170° 10.8'W	14° 22'S
3.	2000	"	170° 29.2'W	14° 17'S
4.				
5.				
6.				



DATE 3 July 64

Time at sunrise = 0644 Position at sunrise = Pago Pago

Time at sunset = 1807 Position at sunset =

Miles traveled from 0000 hours to sunrise = 0

Miles traveled from sunrise to sunset = 7

Miles traveled from sunset to 2400 hours = 0

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.		Moored	Pago Pago	
2.				
3.				
4.				
5.				
6.				

DATE 1 July 64

Time at sunrise = 0637 Position at sunrise = 168° 06'W 13° 37'S

Time at sunset = 1754 Position at sunset = 168 31 W 13 47.5 S

Miles traveled from 0000 hours to sunrise = 85

Miles traveled from sunrise to sunset = 28

Miles traveled from sunset to 2400 hours = 49

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.	0800	D.R	168° 15'W	13° 40'S
2.	1200	"	168° 28.7'W	13° 49.6'S
3.	2000	Celestial	168° 31.2'W	13° 47.6S
4.				
5.				
6.				

DATE 4 July 64

Time at sunrise = 0644 Position at sunrise = Pago Pago

Time at sunset = 1807 Position at sunset = "

Miles traveled from 0000 hours to sunrise = 0

Miles traveled from sunrise to sunset = 0

Miles traveled from sunset to 2400 hours = 0

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.		Moored	Pago	Pago
2.				
3.				
4.				
5.				
6.				

DATE 5 July 64

Time at sunrise = 0644 Position at sunrise = Pago Pago

Time at sunset = 1807 Position at sunset = "

Miles traveled from 0000 hours to sunrise = 0

Miles traveled from sunrise to sunset = 0

Miles traveled from sunset to 2400 hours = 0

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.				
2.		Moored	Pago	Pago
3.				
4.				
5.				
6.				

DATE 6 July 64

Time at sunrise = 0647 Position at sunrise = Pago Pago

Time at sunset = 1809 Position at sunset = 170° 30'W 12° 49'S

Miles traveled from 0000 hours to sunrise = 0

Miles traveled from sunrise to sunset = 94

Miles traveled from sunset to 2400 hours = 84

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.	1206	Visual	170° 30.1W	14° 10.5'S
2.	2000	Celestial	170° 28'W	12° 22 S
3.				
4.				
5.				
6.				

DATE 7 July 64

Time at sunrise = 0630 Position at sunrise = 170° 30'W 10° 02'S

Time at sunset = 1814 Position at sunset = 171° 00'W 07° 47'S

Miles traveled from 0000 hours to sunrise = 90

Miles traveled from sunrise to sunset = 142

Miles traveled from sunset to 2400 hours = 62

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.	0800	Celestial	170° 28.5'W	10° 04.8'S
2.	1200	"	170° 30'W	09° 05'S
3.	2000	"	170° 31.5'W	08° 04'S
4.				
5.				
6.				

DATE 8 July 64

Time at sunrise = 0627 Position at sunrise = 171°51'W 05°13'S

Time at sunset = 1831 Position at sunset = Hull Is.

Miles traveled from 0000 hours to sunrise = 91

Miles traveled from sunrise to sunset = 47

Miles traveled from sunset to 2400 hours = 0

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.	0800	Celestial	172° 00.5'W	05° 11.4S
2.	1200	Visual	172° 12.6'W	04° 29.1'S
3.	2000	"	172° 13.8'W	04° 28.7S
4.				
5.				
6.				

DATE 9 July 64

Time at sunrise = 6637 Position at sunrise = Hull Is.

Time at sunset = 1831 Position at sunset = "

Miles traveled from 0000 hours to sunrise = 0

Miles traveled from sunrise to sunset = 0

Miles traveled from sunset to 2400 hours = 0

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.	0800	Visual	172° 10.9'W	04° 28.7'S
2.	1200	Radar & Vis.	172° 11.5'W	04° 28.5'S
3.	2000	"	172° 13.8'W	04° 28.7'S
4.				
5.				
6.				

DATE 10 July 64

Time at sunrise = 0637 Position at sunrise = Hull Is.

Time at sunset = 1832 Position at sunset = Phoenix Is.

Miles traveled from 0000 hours to sunrise = 0

Miles traveled from sunrise to sunset = 99

Miles traveled from sunset to 2400 hours = 0

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.	0800	Radar & Visual	172° 09.8'W	04° 26.5'S
2.	1200	"	171° 21'W	04° 02'S
3.	2000	"	170° 44.2'W	03° 42.5'S
4.				
5.				
6.				

DATE 11 July 64

Time at sunrise = 0635 Position at sunrise = Phoenix Is.

Time at sunset = 1832 Position at sunset = "

Miles traveled from 0000 hours to sunrise = 0

Miles traveled from sunrise to sunset = 0

Miles traveled from sunset to 2400 hours = 0

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.	0800	Visual & Radar	170° 43.4'W	03° 43.3'S
2.	1200	"	170° 43.5'W	03° 43.6'S
3.	2000	"	170° 44.6'W	03° 42.3'S
4.				
5.				
6.				

DATE 12 July 64

Time at sunrise = 063, Position at sunrise = Phoenix Is

Time at sunset = 1831 Position at sunset = "

Miles traveled from 0000 hours to sunrise = 0

Miles traveled from sunrise to sunset = 6

Miles traveled from sunset to 2400 hours = 0

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.	0800	Radar + Visual	170° 43.6'W	03° 44.2'S
2.	1200	"	170° 44.5'W	03° 42.2'S
3.	2000	"	170° 44.2'W	03° 42.3'S
4.				
5.				
6.				

DATE 13 July 64

Time at sunrise = 0635 Position at sunrise = Phoenix Is.

Time at sunset = 1831 Position at sunset = "

Miles traveled from 0000 hours to sunrise = 0

Miles traveled from sunrise to sunset = 0

Miles traveled from sunset to 2400 hours = 0

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.	0800	Radar + Visual	170° 43.8'W	03° 44.1'S
2.				
3.				
4.				
5.				
6.				

DATE 14 July 64

Time at sunrise = 0631 Position at sunrise = Phoenix Is.

Time at sunset = 1832 Position at sunset = Enderbury Is.

Miles traveled from 0000 hours to sunrise = 0

Miles traveled from sunrise to sunset = 40

Miles traveled from sunset to 2400 hours = 0

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.	0800	Radar & Visual	170° 45'W	03° 41'S
2.	1200	"	171° 06.8'W	03° 05.5'S
3.	2000	"	171° 07.1'W	03° 09'S
4.				
5.				
6.				

DATE 15 July 64

Time at sunrise = 0631 Position at sunrise = Enderbury Is.

Time at sunset = 1832 Position at sunset = "

Miles traveled from 0000 hours to sunrise = 0

Miles traveled from sunset to 2400 hours = 0

Miles traveled from sunset to 2400 hours = 0

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.	0800	Radar & Visual	171° 06.3'W	03° 08.1'S
2.	1200	"	171° 06.2'W	03° 07'S
3.	2000	"	171° 07'W	03° 09'S
4.				
5.				
6.				

DATE 16 July 64

Time at sunrise = 0631 Position at sunrise = Enderbury Is.

Time at sunset = 1832 Position at sunset = "

Miles traveled from 0000 hours to sunrise = 0

Miles traveled from sunrise to sunset = 0

Miles traveled from sunset to 2400 hours = 0

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.	0800	Radar & Visual	171° 06.1'W	03° 08.6'S
2.	1200	"	171° 06.4'W	03° 03.5'S
3.	2000	"	171° 06.8'W	03° 06.7'S
4.				
5.				
6.				

DATE 17 July 64

Time at sunrise = 0631 Position at sunrise = Enderbury Is.

Time at sunset = 1834 Position at sunset = 173° 30'W 03°22'S

Miles traveled from 0000 hours to sunrise = 0

Miles traveled from sunrise to sunset = 135

Miles traveled from sunset to 2400 hours = 40

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.	0800	Radar & Visual	171° 17'W	03° 04.7'S
2.	1200	"	171° 53.5'W	02° 51.9'S
3.	2000	Celestial	173° 30.8'W	03° 22'S
4.				
5.				
6.				

DATE 18 July 64

Time at sunrise = 0632 Position at sunrise = McKean Is.

Time at sunset = 1841 Position at sunset = McKean Is.

Miles traveled from 0000 hours to sunrise = 0

Miles traveled from sunrise to sunset = 0

Miles traveled from sunset to 2400 hours = 0

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.	0800	Radar & Visual	174° 08.4'W	03° 36.1'S
2.	1200	"	174° 08.5'W	03° 34.3'S
3.	2000	"	174° 07.7'W	03° 34.5'S
4.				
5.				
6.				

DATE 19 July 64

Time at sunrise = 0633 Position at sunrise = McKean Is.

Time at sunset = 1841 Position at sunset = "

Miles traveled from 0000 hours to sunrise = 0

Miles traveled from sunrise to sunset = 0

Miles traveled from sunset to 2400 hours = 0

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.	0800	Radar & Visual	174° 08.8'W	03° 35.8'S
2.	1200	"	174° 09'W	03° 36'S
3.	2000	"	174° 07.8'W	03 34.5'S
4.				
5.				
6.				

DATE 20 July 64

Time at sunrise 0633 Position at sunrise McKean Is.

Time at sunset 1841 Position at sunset 175°31'W 01°41'S

Miles traveled from 0000 hours to sunrise 0

Miles traveled from sunrise to sunset 145

Miles traveled from sunset to 2400 hours 56

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.	0800	Radar & Visual	174° 14'W	03° 31'S
2.	1200	"	174° 53'W	02° 53'S
3.	2060	Celestial	175° 46'W	01° 28'S
4.				
5.				
6.				
7.				

DATE 21 July 64

Time at sunrise 0640 Position at sunrise Baker Is.

Time at sunset 1855 Position at sunset "

Miles traveled afrom 0000 hours to sunrise 55

Miles traveled from sunset to 2400 hours 0

Miles traveled from sunrise to sunset 0

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.	0800	Radar & Visual	176° 30'W	0° 12.5'N
2.	1200	"	176° 29.7W	0° 10.5'N
3.	2000	"	176° 29'W	0° 12.7N
4.				
5.				
6.				
7.				

DATE 22 July 64

Time at sunrise 0745 Position at sunrise Baker Is.

Time at sunset 2000 Position at sunset Howland Is.

Miles traveled from 0000 hours to sunrise 0

Miles traveled from sunrise to sunset 37

Miles traveled from sunset to 2400 hours 0

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.	0800	Radar & Visual	176° 30' W	00° 19' N
2.	1200	"	176° 40' W	00° 49.2 N
3.				
4.				
5.				
6.				
7.				

DATE 23 July 64

Time at sunrise 0749 Position at sunrise Howland Is.

Time at sunset 2004 Position at sunset "

Miles traveled afrom 0000 hours to sunrise 0

Miles traveled from sunset to 2400 hours 0

Miles traveled from sunrise to sunset 0

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.		At anchor Howland Is.		
2.				
3.				
4.				
5.				
6.				
7.				

DATE 24 July 64

Time at sunrise 0749 Position at sunrise Howland Is.

Time at sunset 1959 Position at sunset "

Miles traveled from 0000 hours to sunrise 0

Miles traveled from sunrise to sunset 0

Miles traveled from sunset to 2400 hours 0

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.	At anchor Howland Is.			
2.				
3.				
4.				
5.				
6.				
7.				

DATE 25 July 64

Time at sunrise 0749 Position at sunrise Howland Is.

Time at sunset 1959 Position at sunset 175° 17'W 02°32'N

Miles traveled afrom 0000 hours to sunrise 0

Miles traveled from sunset to 2400 hours 58

Miles traveled from sunrise to sunset 146

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.	1200	Radar visual	176° 20'W	01° 10·8'N
2.	2000	Celestial	175° 17'W	02° 32'N
3.				
4.				
5.				
6.				
7.				

DATE 26 July 64

Time at sunrise 0726 Position at sunrise 173°24'W 04°32'N

Time at sunset 1945 Position at sunset 171°33'W 06°50'N

Miles traveled from 0000 hours to sunrise 56

Miles traveled from sunrise to sunset 177

Miles traveled from sunset to 2400 hours 62

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.	0800	Celestial + Loran	173° 22'W	04° 36.6'N
2.	1200	"	172° 41.2'W	05° 18.4'N
3.	2000	"	171° 30'W	06° 54.2'N
4.				
5.				
6.				
7.				

DATE 27 July 64

Time at sunrise 0707 Position at sunrise 169°35'W 08°52'N

Time at sunset 1936 Position at sunset 167°53'W 10°44'N

Miles traveled afrom 0000 hours to sunrise 84

Miles traveled from sunset to 2400 hours 60

Miles traveled from sunrise to sunset 153

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.	0800	D.R.	169° 24.7'W	09° 00'N
2.	1200	Celestial + Loran	168° 49.2'W	09° 40'N
3.	2000	"	167° 50'W	10° 49.2'N
4.				
5.				
6.				
7.				

DATE 28 July 64

Time at sunrise 0649 Position at sunrise 166° 18'W 12° 25'N

Time at sunset 1930 Position at sunset 164° 36'W 14° 28'N

Miles traveled from 0000 hours to sunrise 98

Miles traveled from sunrise to sunset 171

Miles traveled from sunset to 2400 hours 65

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.	0800	Celestial & Loran	166° 13'W	12° 30'N
2.	1200	"	165° 39'W	13° 18.8'N
3.	2000	"	164° 33.1'W	14 31.5'N
4.				
5.				
6.				
7.				

DATE 29 July 64

Time at sunrise 0630 Position at sunrise 163°12'W 16°N

Time at sunset 1920 Position at sunset 161° 21'W 18°16'N

Miles traveled afrom 0000 hours to sunrise 91

Miles traveled from sunset to 2400 hours ~~0719~~ 63

Miles traveled from sunrise to sunset ~~675~~ 175

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.	0800	~~163° 05'W~~ Loran & Celestial	163° 05'W	16° 12'N
2.	1200	Celestial	162° 37.2'W	16° 53'N
3.	2000	"	161° 19.5'W	18° 18.7'N
4.				
5.				
6.				
7.				

DATE 30 July 64

Time at sunrise 0610 Position at sunrise 159° 15'W 20° 07'N

Time at sunset _____ Position at sunset _____

Miles traveled from 0000 hours to sunrise 91

Miles traveled from sunrise to sunset _____

Miles traveled from sunset to 2400 hours _____

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.	0800	Celestial & Loran	159° 04.8'W	20° 17.6'N
2.	1200	Celestial & Radar	158° 27.3'W	20° 36'N
3.				
4.				
5.				
6.				
7.				

DATE _____

Time at sunrise _____ Position at sunrise _____

Time at sunset _____ Position at sunset _____

Miles traveled afrom 0000 hours to sunrise _____

Miles traveled from sunset to 2400 hours _____

Miles traveled from sunrise to sunset _____

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.				
2.				
3.				
4.				
5.				
6.				
7.				

white neck Petrel

on 27 + 28 July

28 - 165 - 37 13 - 18.8

27 - 168 49.2 09 40

CENTRAL PACIFIC OCEAN

180° 170° 160° 150°

30° NORTH

20°

10°

0°

10° SOUTH

180° WEST 150° WEST

HAWAIIAN ISLANDS

KURE I.
MIDWAY I.
PEARL AND HERMES REEF
LISIANSKI I.
LAYSAN I.
GARDNER PINNACLES
FRENCH FRIGATE SHOALS
NECKER I.
NIHOA I.
NIIHAU I.
KAUAI I.
OAHU I.
KAULA I.
MOLOKAI I.
LANAI I.
MAUI I.
KAHOOLAWE I.
HAWAII I.

JOHNSTON-SAND I.

LINE ISLANDS

KINGMAN REEF
PALMYRA I.
WASHINGTON I.
FANNING I.
CHRISTMAS I.
HOWLAND I.
BAKER I.
JARVIS I.
MALDEN I.
STARBUCK I.
TONGAREVA I.
CAROLINE I.

PHOENIX ISLANDS

CANTON I.
ENDERBURY I.
McKEAN I.
BIRNIE I.
PHOENIX I.
HULL I.
SYDNEY I.
GARDNER I.

TOKELAU ISLANDS

ATAFU I.
NUKUNONO I.
FAKAOFU I.

0 100 200 300 400 500 STATUTE MILES

30° 20° 10° EQUATOR

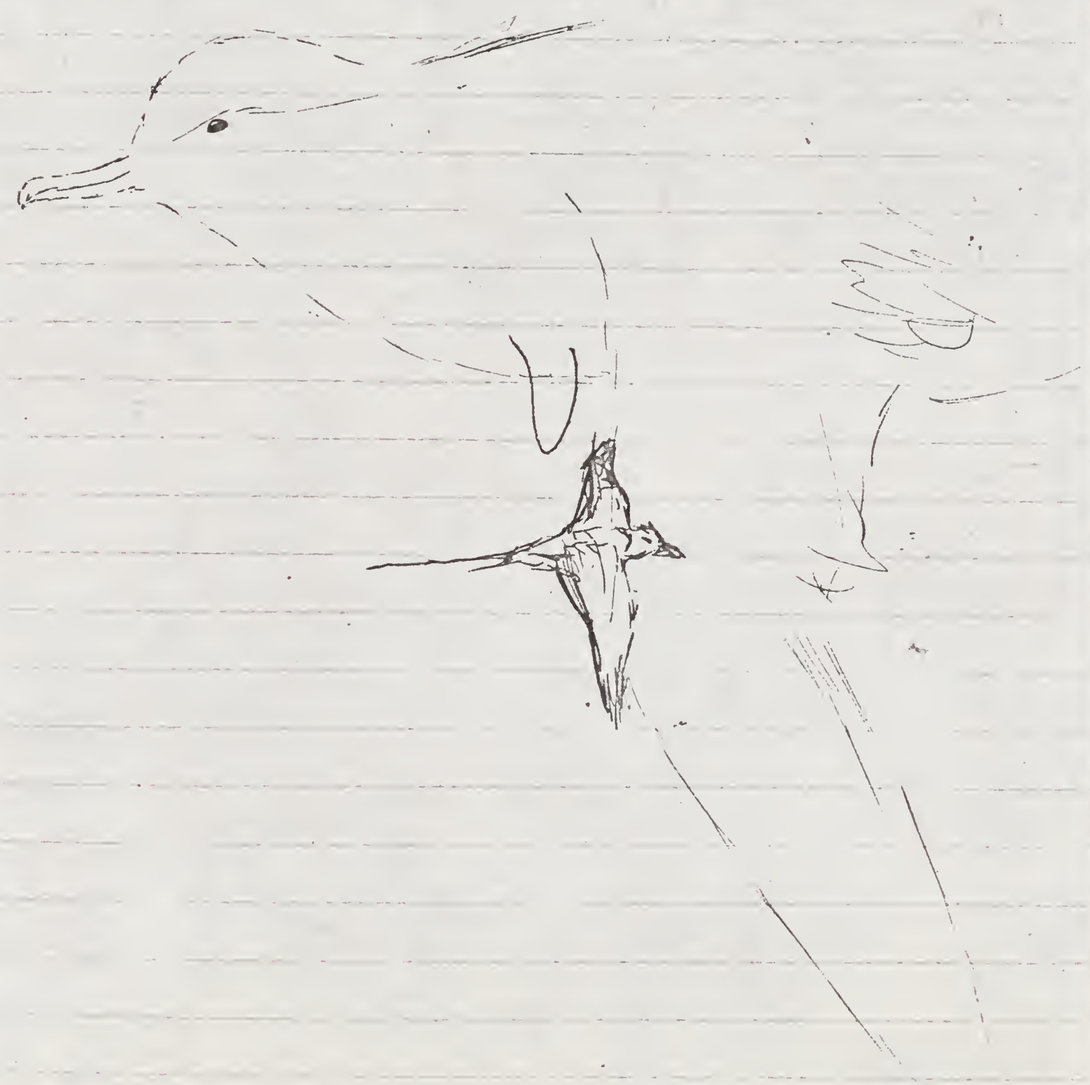
July 1
SE wind

R. Clapp

0630			Start watch
0635	W	1	W.T. Tropic
0639	NE	1	RT. Tropic
0650			quit
0704			start watch
0722	SW	15+	Sooty tern
	SW	2	~~Procellariformes~~ Kermatic petrel ?
	E	1	W.T. Tropicbird
0732		1	W.T. Tropicbird
0735	SW	1	Procellariformes
0800	E	1	White-necked petrel
0812		2	W.T. Tropic bird
0830		3	W.T. Tropic bird
0843	S	1	Sooty Tern
0909		1	W.T. Tropic bird
0929	S	1	W.T. Tropic
1009	SE	1	RT Tropic
	SE	1	W.T. Tropic
1029	NW	1	W.T. Tropic
1030		1	W.T. Tropic
1103	W	1	W.T. Tropic
1106	E	1	Cook's petrel ?
13:22	E	1	Bonin Island Petrel ?
1440	S	1	W.T. Tropicbird
1522	W	1	W.T. Tropic bird
1523	W	1	W.T. Tropic bird
153?		1	Shearwater (Sibley, et al)
1602		1	Shearwater (Sibley et al)

0722 Dark brown on Top, Audubon type on bottom, Nighthawk like marks on top of wings

0800 white collar black eye patch ~~Tagua~~ "W" on back upper part dark brown underside Audubon like



1 July 1964

S wind mod Moderate
75-100% cloud
cover ~~clear~~

1605	1	5	W. T. Tropic bird
1606	3	5	Sooty Tern
	clear	at	1720

July 2
Winds from south sky 4/8 cloudy

0500			start watch
0854		1	R.F. Booby
0905		1	R.F. Booby
9:13	circling	1	W.T. Tropic Bird
0925	S	1	W-t. Tropicbird
0927	S	1	Common Noddy
0945	W	1	Wh-t. Tropicbird
0950	S	1	Red-f. Booby
1000	S	1	Wh-t. Tropicbird
1005	S	1	Wh-t. Tropicbird
1006	S	1	Wh-t. Tropicbird
1011		1	Wh-t. Tropicbird feeding
1018	NE	1	R-footed Booby
1019	NE	1	R-footed Booby
1021		2	Wh-t. Tropicbird circling
1032	NE	1	Wh-t. Tropicbird
1035-45		1	Brown Booby
		1	Gr. Frigatebird
		6	Wh-t. Tropicbird
		200	Red-f. Booby
		1000	C. Noddy

} acting feeding flocks moved S then E

1102	N	1	Red-f. Booby
1103	W	1	Wh-t. Tropicbird
1105	W	1	Fairy Tern
1127	W	1	Wh-t. Tropicbird
1128	N	1	Common Noddy
1143	E	1	Booby
1145			quit

1022 this was another widespread medium sized dark & white Petrel, white forehead, no W on back

July 26 Overcast, misty clad occasional squalls, strong E wind
Start 0500

~~1215~~		~~1~~	
0840		1	medium sized shearwater, white underneath, whitish head, gray back, no flap
1651	NE	1	medium sized Petrel, dark brown above, white collar, black cap, black bordered underwing, three flaps then a sail
0905		1	Procellariform
0915	E	1	Cook's Petrel
0947	SE	1	Wedgetail dark
1016	E	2	Phoenix I. ~~Petrel~~ Petrel dark above light below, white forehead
1022	NE	1	Gould's Petrel?
1030	NE	2	Red-tailed Tropicbird
1040		1	Procellariform
1048	N	1	small Pterodroma (black & white)
1053		2	medium-sized black & white Shearwater
1057	E	1	Wedgetail? dark
1058	NE	1	small black & white Petrel
1107	N	1	Bonin or Cook's Petrel?
1110		1	Bonin Island Petrel?
1134		1	Red footed Booby (DH)
			cloud at 1145
			open at 1300
1305	SW	1	Bonin Island Petrel
1315	NE	1	Wedge-tail Shearwater
1316	N	1	Bonin Island Petrel
1323	NW	1	Bonin Island Petrel
1329	NW	1	Blue-f. Booby
1333	NE	4	Pterodroma sp. (quite distant)
1335	NW	1	Fairy Tern

July 26, 1964

Time	Direct.	#	Remarks
1435	SW	1	Cookis Petrel
1550	NW	1	[redacted]? crossed bow of the ship. Could not be seen distinctly but appeared to be brown. Was not seen to break the surface of the water. About 10-14' long. Shark?
1618	NE	1	Bonin Island Petrel
	[redacted]	[redacted]	[redacted]

Closed down 1630

1120. Crossed bow of ship fairly close. Full description of white-necked Petrel on 0800 on 1 July. Even sailed on watch saw white collar without binoculars. Black cap, black patch around eye, prominent white collar, back brown, wings dark brown, white underside, wings white with black border.

9.8

Wind NE 20-25 knots, Sky: Overcast 9/10ths. Sea: about 8 foot swells, whitecaps.

27 July 1964

STARTED	WATCH	0820
0823	NE	1	Bonin Is. Type Petrel
0826	NW	1	Wedge Tail Shearwater
0826	NW	1	Shearwater Dark above white below
0845	SE	1	Bonin Island Petrel
0909	SW	2	Wedge-tail Shearwater?
0929	SW	2	Bonin Island Petrel
0955	NE	1	Wedge-Tail Shearwater
0956	—	1	Bird sp - on horizon to west - just caught a glimpse of it.
—	—	—	
1002	E	1	Wedge-tailed Shearwater
1007	SE	1	Pterodroma sp. - distant
1010	NW	1	Bonin Island Petrel
1101	NW	1	Bonin Island Petrel
1120	N	1	White-necked Petrel
1250	NE	4	Pufinus sp. all dark.
1250	NE	2	Tern (Sooty?)
			1300-1330 Secured watch to prepare for heavy weather - tie down gear, etc.)
1340	SE	1	Like Cook's Petrel without "W" marking on back - about 2X the size
1447	NE	1	dark Wedgetail
1450	NE	1	dark Wedgetail (immature?)
1454	N	1	Bonin Island type
1514	N	1	Bonin Island type.
1530	NE	1	dark Wedgetail.
1532	NW	1	Gould's Petrel?

27 July 1964 (cont)

1535	NE	1	~~Cook's Petrel~~? Bonin Isl
1552	NE	1	Pterodroma sp.?
1621	N	1	~~Cook's Petrel~~? Bonin Isl
1622	N	1	Bonin Island.
1623	NE	1	dark Wedgetail
1630	S	1	~~Cook's Petrel~~ Bonin Island
1640	S	1	~~Cook's Petrel~~ Bonin Island
1640	W	1	~~Cook's Petrel~~ Bonin Isla
1640	S	1	dark Wedgetail.
1643	N	1	dark Wedgetail
	closed watch for dems, at 1650		
	reopened at 1740		
1805	S	1	black & wht Pterodroma sp.
1811	N	1	~~Cook's Petrel~~?
1812	NE	1	black white Pterodroma sp.
1815	SE	1	Bonin Island type
1816	S	1	~~Cook's Petrel~~
1828	SE	1	Bonin Island type.
1845	NE	1	dark Wedgetail
1858	SE	1	~~Cook's Petrel~~ (Bonin ~~Cook~~?)
1901	NE	1	immature Sooty Tern
1906	W	1	~~Cook's Petrel~~ (Bonin ~~Cook~~)
1916	E	1	~~Cook's Petrel~~ Bonin
1924	S	1	dark Wedgetail
	closed at		1930

1621 medium-sized Petrel, Bonin Island, white forehead, black eye patch, black cap, dark brown back & wings, no pattern, rump light brown, tail dark brown, relatively short & blunt. Passed close to bow. White underparts, black border underwing.

1816 medium-sized Petrel, Bonin Island, white forehead, black cap, black eye patch, grey back, extending into bars, ~~the~~ remarks dark brown, grey, no W pattern, lower back dark brown, rump feathers light brown or tan, tail dark brown. The light rump feathers gave a conspicuous light patch (crescent shaped or V shaped) following outline of upper tail coverts, conspicuous at some distance. White underneath with black bordered underwing. Passed close to bow.

1858 Identical to 1816, Bonin Island, but with W pattern on back, not distinct however, passed close to bow.

1906 Identical to entry 1858, Bonin Island

0820 all birds were too far out to identify they appeared to be feeding

28 July 1964

open at 0740

clear skies, scattered cumulus clouds steady E wind 3-4 foot swells, few white caps

time	direction	number	species + remarks
0745	N	1	black + white Storm Petrel
0803		1	Bonin Island type
0820		12	black + white Procellariforms
0820		1	Sooty Tern?
0841	SE	1	dark Wedgetail
0844	SE	1	dark Wedgetail
0846	NW	1	Bonin Island type
0847	SW	1	Bonin Island type
0857	SE	1	Bird sp.
0905	S	1	Bonin Island
0909	N	1	Bonin Island
0930	S	1	" "
0931	S	1	White rumped Petrel
0933	NE	3	Wedgetail (dark)
0938	E	1	Wedgetail (dark)
0939	E	1	dark Wedgetail (on water at first)
0955	S	1	Bonin Island
0958	W	1	Bonin Island type
1014	SW	1	Bonin Island
1023	SW	1	Bonin Island P.
1045	NE	1	Wedge-tailed Shearwater
1055	SW	1	Bonin Island Petrel
1100	SW	2	Bonin Island Petrel
1105	NE	5	Fairy Tern } not feeding
1105	NE	6	~~Sooty~~ Tern } not feeding
1105	NE	1	Wedge-tail } not feeding

28 July 1964

1105	NE	1	Bonin Island Petrel
1130	SW	1	Bonin Island Petrel
1134	SW	1	Bonin Island Petrel
	(closed for chow 1145 - 1205)		
1230	SW	1	Bonin Island Petrel
1235	E	1	Red-t. Tropicbird
1240	NW	1	Bonin Is. Petrel
1328	S	1	Bonin Is. Petrel
1421	NE	1	Bonin Is. Petrel
~~1558~~	S	1	Bonin Island Petrel
1600	E	1	dark Wedge-tail

Howland Island
July 24, 1964

Quadrat Studies of the Vegetation

#	Location	Species Present SP/T/Q		#	Soil
1.	west of p.m. #2 on the west beach	Lepturus	6	s-4 m-1 1-1	beach rock, sand, 2° slope west
2.	30 ft. due e. from #1.	Lepturus	9	s-1 m-1 1-7	level beach with many coral rocks at surface sand underneath
3.	15 ft. e. of #2.	Lepturus	14	s-0 m-2 1-12	beach rock with sand beneath, 2° slope east
		Portulaca	3	s-0 m-1 1-2	
4.	20 ft. e. of #3.	Lepturus	5	s-0 m-2 1-3	beach rocks with small pockets of sand, sand beneath B. seedlings sprouting next to closely packed stones. Slope 8 w.
		Portulaca	3	s-0 m-3 1-0	
		Boerhaavia	29	s-26 m-3 1-0	
5.	15 ft. e. of #4.	Lepturus	9	s-1 m-2 1-6	a 6° slope west, sand and gravel with some large rocks. L. - one plant dead in plot.
		Portulaca	2	s- 1 m-1 1-0	
		Boerhaavia	4	s-2 m-2 1-0	
6.	15 ft e. of #5	Lepturus	7	s-2 m-1 1-4	
		Portulaca	1	s-0 m-1 1-0	a 3° slope w., gravel and rock
		Boerhaavia	0	s-0 m-0 1-0	
7.	10 ft. e. of #6 - near the slope crest	Lepturus	8	s-1 m-1 1-1	
		Portulaca	1	s-0 m-1 1-0	a 2° slope west, gravel at surface, sand beneath with heavy stones at the surface.
		Boerhaavia	4	s-2 m-2 1-0	
		Digitaria	10	s-8 m-0 1-2	

#	Location	Species Present SP/T/Q	#	Soil
8.	20 ft. n. of p.m. #2	Lepturus 9	s-4 m-4 l-1	
		Portulaca 5	s-1 m-2 l-2	level large rocks with surface gravel and
		Boerhaavia 5	s-2 m. -3 l-0	sandy subsoil
		Digitaria 8	s-3 m-0 l-5	
		Tribulus 11	s-0 m-11 l-0	
9.	30 ft. e. of p.m. #2	Digitaria 10	s-0 m-0 l-10	sandy soil
		Tribulus 1	s-0 m-0 l-1	
		Boerhaavia 1	s-0 m-1 l-0	
		Portulaca 2	s- 0 m-1 l-1	
10.	20 ft. e. of #9	Lepturus 8	s-0 m- 0 l-8	
		Digitaria 4	s- 0 m- 0 l- 4	2° slope e. sandy soil
		Portulaca 4	s-0 m-2 l-2	
		Boerhaavia 12	s-0 m-3 l-0	
		Tribulus 1	s-0 m-0 l-1	

#	Location	Species Present SP/T/Q		#	Soil
11.	40 ft. due east of p.m. #8.	Lepturus s-0 m-0 l-9	9		
		Tribulus s-0 m-0 l-3	3		gravel disturbed site old runway site
		Portulaca s-0 m-1 l-2	3		
12.	65 ft. due east of p.m. #8	Digitaria s-0 m-0 l-3	3		
		Boerhaavia s-0 m-0 l-3	3		as above
		Tribulus s-0 m-0 l-1	1		
13.	85 ft. due east of p.m. #8	Tribulus s-0 m-0 l-6	6		
		Portulaca s-0 m-0 l-1	1		as above
		Boerhaavia s-0 m-0 l-1	1		
14.	120 ft. due east of p.m. #8.	Tribulus s-0 m-0 l-2	2		east of runway gravel and sand
		Lepturus s-0 m-0 l-3	3		
15.	170 ft. due east of p.m. #8	Tribulus s-0 m-0 l-2	2		gravel and sand on top with sand beneath.
		Lepturus s-0 m-0 l-6	6		
		Portulaca s-0 m-0 l-1	1		
		Boerhaavia s-0 m-0 l-1	1		

#	Location	Species Present SP/T/Q		#	Soil
16.	215 ft. east of p.m. #8.	Digitaria	5	s- 0 m- 2 l- 3	sand and gravel level
		Tribulus	4	s- 0 m- 0 l- 4	
		Portulaca	4	s- 0 m- 0 l- 4	
		Boerhaavia	2	s- 0 m- 0 l- 2	
17.	260 ft. east of p.m. # 8.	Lepturus	5	s- 3 m- 1 l- 1	sand, soil with more organic material
		Boerhaavia	1	s- 0 m- 0 l- 1	
		Portulaca	8	s- 0 m- 1 l- 7	
		Tribulus	1	s- 0 m- 0 l- 1	
18.	300 ft. east of p.m. #8.	Portulaca	6	s-0 m-0 l-6	sandy soil with gravel on top level
		Tribulus	6	s-0 m-0 l-6	
		Digitaria	1	s-1 m-0 l-0	
19.	135 ft. from east rock beach	Boerhaavia	7	s-0 m-2 l-5	bare coarse gravel
20.	120 ft. from east rock beach	Digitaria	13	s-4 m-0 l-9	sand pockets between coarse gravel
		Portulaca	1	s-0 m-0 l-1	
		Boerhaavia	6	s-0 m-0 l-6	

#	Location	Species Present SP/T/Q		#	Soil
21.	85 ft. from (west of) east rock beach	Lepturus	3	s-0 m-0 1-3	gravel with sand between coral rocks
		Portulaca	4	s-0 m-3 1-0	
		Boerhaavia	5	s-0 m-5 1-0	
22.	45 ft. from rock beach due east of p.m. #8	Boerhaavia	5	s-0 m-0 1-5	large coral rocks with gravel and sand pockets 1° slope e.
		Portulaca	12	s-0 m-0 1-12	
23.	On the ne. side, along the e-w line from p.m. # 9 10 ft. due west of p.m. #8	Portulaca	2	s-0 m-0 1-2	sandy soil 1 slope west
		Digitaria	7	s-4 m-3 1-0	
		Tribulus	4	s-0 m-0 1-4	
24.	25 ft. due west of p.m. #8	Tribulus	5	s-0 m-0 1-5	sandy soil 1 slope west
		Digitaria	8	s-1 m-6 1-1	
		Lepturus	1	s-0 m-0 1-1	
25.	40 ft. due west of p.m. #8	Digitaria	2	s-0 m-0 1-2 (very large)	sandy soil
26.	10 ft. due s. of p.m. #8	Lepturus	4	s - m - l -4	

#	Location	Species Present		#	Soil
		Boerhaavia	3	s-0 m-0 1-3	sandy
		Digitaria	4	s-0 m-4 1-0	soil
		Portulaca	4	s-0 m-0 1-4	
27.	25 ft. due south of p.m. #8	Lepturus	6	s-0 m-0 1-6	sandy soil
		Portulaca	4	s-0 m-2 1-2	
		Boerhaavia	1	s-0 m-0 1-1	
		Digitaria	2	s-0 m-0 1-2	
28.	45 ft. due south of p.m. #8	Lepturus	6	s-0 m-0 1-6	sand soil
		Boerhaavia	2	s-0 m-0 1-2	
		Portulaca	3	s-0 m-0 1-3	
29.	10 ft. due east of p.m. #8	Digitaria	3	s-0 m-0 1-3	sand soil
		Portulaca	9	s-0 m-0 1-9	
		Boerhaavia	1	s-0 m-0 1-1	
30.	25 ft. due east of p.m. #8	Digitaria	6	s-0 m-1 1-5	sand soil
		Portulaca	1	s-0 m-1 1-0	
31.	40 ft. due east of p.m. # 8	Digitaria	5	s- m- 1-5	

Lepturus
s.- seedling or a one crowned plant.
m.- two crowns or many, clump two to five in. in dia. at ground level.
l.- more than five in. in dia. at ground level.

Portulaca
s.- seedling, plants one to six inches high.
m.- plants six to eight inches high, stems to four in. in dia. at ground level.
l.- plants about eight inches high, stems more than four in. in dia. at ground level.

Boerhaavia
s.- seedling, stems one to five in. long.
m.- stems five to twelve in. long.
l.- stems exceeding twelve inches in length.

Digitaria
s.- seedling or a one crowned plant.
m.- plant two to eight crowned, from three to eight in. in dia. at ground level.
l.- plant with eight or more crowns, more than eight in. in dia. at ground level.

Tribulus
s.- seedling, stems less than six in. in length.
m.- stem from six to eighteen in. in length.
l.- stems in excess of eighteen in. in length.

Washington Island, June 9-13, 1964

June 9, 1964 - Plant collections were made by C.D. Hackman and D. Gill along the path leading around the north side of the island while C.R. Long and P. Marshall collected along the road which borders the south side of the island. The two endemic birds were seen by both parties. A Cyperus with a white head was found growing in waste areas along the road on the west and north . The trunks of Cocos support a number of lichens and mosses which are particularly thick on the wet sides of the trunk (where water drains from the fronds and the crown of the tree). The Cocos plantation is serviced by roadways which branch off of the shore road in towards the vegetated rim of the atoll and the lagoon. These are very damp and support a roadside vegetation composed of Polypodium, Nephrolepis, Asplenium, Synedrella, Cynodon and Fleurya. One bracket fungus and several capped fungi were observed and collected - all growing on Cocos. Mr. William Frew,-the resident manager for the Burns, Philp Co., Ltd. was kind enough to provide bed and board for several days.
June 10, 1964 - With the assistance of P. Marshall and D. Gill peat samples were gathered from the west bog. Plant collections were made from the west bog, the canal leading northeast into the open bog and, later in the afternoon, from the waste areas immediately behind the village.

June 11, 1964 - Peat samples were taken from the bog bordering thefresh-water lagoon. Mr. Frew arranged for the writer to have the use of a small boat with outboard motor in order to cross the lake and visit Te Manounou on the east end of the island. The Cocos forest, propagating itself, comes directly to the waters edge. In a few isolated areas on the north and south shores of the lake there are Scirpus reeds growing near the shore or continuous with the shore. More often these clumps of reeds are found out from the shore in up to one foot of water - rooted in muck on top of what were at one time coral heads of the lagoon. Canals and locks on the southwest and east sides of the island are used to regulate the water level of the lake during the rainy season. At this season the bog is in some places about a foot above the water level of the lake. At other times the entire bog is under water. At the entrance to the canal on the east was growing a shrubby member of the Onagraceae. Our reference for topography and direction was a map made by Captain Brett Hilder. A copy of this map has been forwarded to us courtesy of the Burns, Philp Co., Ltd. While the succession at the north, east and south sides of the lake may be quite slow, it was noted that both Cocos and Pandanus were forming a line of elevated vegetation on the west end of the lake. This extends from the forest on the south to the canal (but thinning). The east and west portions of the bog are separated by a peninsula of forest which is well established. Collections were made on the east shore. The Pisonia trees on the beachrock at the east end are reproducing themselves. Along the east shore the Messerschmidtia and Pisonia give excellent examples of wind shearing of vegetation. Along the canal on the east were noted large Cyrtosperma, breadfruit, and young Pandanus. Large areas of the forest as well as the open bog are covered with Polypodium. The red-footed boobies nest in the Pisonia and Messerschmidtia on the east end. One correction to Hilder's map would be that the peat in some areas is in excess of 6 ft..

June 12, 1964 - Surf conditions dangerous. A survey of the cultivated and ornamental plants on the island was made. The following were observed and collected:*

Artocarpus incisus (Thunb.) L.f. - used as a source of food and wood by the resident Gilbertese.
Carica papaya L. - used as a source of food.

Pandanus tectorius Park - used as a source of food and construction material.
Cocos nucifera L. - used as a source of food, construction and trade.
Calophyllum inophyllum L. - used as a source of wood.

Ficus sp. - used as a source of shade.

Hibiscus rosa-sinensis L. - used as decoration.

Morinda citrifolia L. - used as a source of food.

Psidium guajava L. - used as a source of food.

Mirabilis jalapa L. - used as decoration.

Citrus aurantiifolia (Christ.) Swingle - used as a source of food.

Tagetes erecta L. - used as decoration.

Lycopersicon esculentum Mill. - used as a source of food.

Lactuca sativa L. - used as a source of food.

Colocasia esculenta (L.) Schott. - a prime source of food.

Acalypha wilkesiana Muell.-Arg. - used as decoration.

Zephyranthes rosea (Spreng.) Lind. - used as decoration.

Acanthaceae (shrub) - used as decoration.

Allium fistulosum L. - used as a source of food.

Cucurbita pepo L. - gourds used as ornaments.
Boehmeria nivea (L.) Gaud. - used as a source of fiber.

June 13, 1964 - The surf conditions at the Boar passage where an earlier landing had been made are still unsatisfactory. The passage on the north side, Ore Abaram, proved to be excellent. We push out into the surf at 11:30 am. for the Takelma.

* a preliminary list

Photographs:* Washington Island, June 9-13, 1964, C.R. Long

June 9, 1964 (July, in black)

1. Cocos - Pandanus - Scirpus, in the west bog along the canal.
2. Close-up of the Scirpus reed, west bog.
3. Cocos - Pandanus -Scirpus, in the west bog along the canal.
4. Scirpus bog, west bog, core sampler.
5. Pandanus in Scirpus forming an elevated hummock, looking north from the canal, west bog.
6. Cocos forest, Scirpus, Polypodium on Cocos trunk, Colocasia cultivated in cleared area along the canal.
7. D. Gill and P. Marshall in the Scirpus bog - west end, south side, Pandanus edge in back.
8. Cyperus - to 2 ft. forming an "understory" in the Scirpus bog - on fringe or open spaces near the reeds and also under the reeds.
9. Pandanus edge and Scirpus bog.
10. Dense Cocos forest, Asplenium, Pisonia - south side of island along copra trail.
11. Cocos plantation, Asplenium nidus, Polypodium covering the Cocos trunks and the ground. Note piles of husks and shells.
12. Cocos, Pisonia, Boermeria - west end of the island.
13. Along the road on the north side of the island - Cocos, Polypodium, Boermeria.
14. North side - growing in the tracks and to the side of the road - Cyperus.
15. Boermeria shrubs - in the waste area behind the west village.
16. Copra drying racks.
17. (as above).

June 11, 1964

18. Two Gilbertese helpers - west of the fresh water lagoon in bog - Scirpus, Nephrolepis, Polypodium.
19. Pandanus, Scirpus -looking north from the canal.
20. Along the canal, west bog, looking east - Pandanus, Polypodium, Cocos and Scirpus.
21. Cocos, young Pisonia, Polypodium covering the soil surfaces, east end of the island near village.
22. (as above), Cocos litter quite heavy, soils dark, much humus.
23. Village huts of Te Manounou.
24. Fimbristylis, Boerhaavia on gravel near village, east end.
25. Wind sheared Pisonia and Messerschmidtia, east end looking south.
26. (as above).
27. Pisonia trees at the east end - nesting red-footed boobies.
28. Two friends along path paralleling the canal, east end - dense Cocos and Cyrtosperma.
32. Freshwater lagoon with Scirpus clumps along the edge, Looking west.
33. Cocos forest bordering the canal, east end, Polypodium and shrub: (fam. Onagraceae).
35. North side of the lagoon - Cocos and Scirpus stands.
36. (as above).
37. The east bog - Scirpus, Pandanus, Polypodium along the canal.
38. Humps of Polypodium on bare bog - in the east bog near the canal. Area flooded regularly.

* 2x2 Color Slides

June 12, 1964 (August, in red)

2. Cordia growing in the west village, in flower.
3. Artocarpus about 40 ft. - foliage evergreen, north side of village.
4. Zephryanthes - in flower, growing in the lawn of the plantation house.
7. William Frew, dispensary, and Hibiscus rosa-sinensis varieties.
8. Waste area east of village- Morinda, Scaevola.
9. Morinda citrifolia, flower and fruit.
10. Waste area behind the west village - Morinda, Scaevola, Pisonia, soil covered with solid stand of herbs annuals - Verbesina.
11. Waste area by the road north of the village - Boermeria, Polypodium, Pandanus, Pisonia. Along this road there was also a grove of Artocarpus grown exclusively for construction wood.
12. Cocos along the road on the nw. end, Polypodium on ground.
13. Artocarpus, Boermeria, Cocos and Polypodium along road nw. end.
14. Edge of the Cocos forest, east bog, dense Polypodium in the foreground.
15. Convolvulus covering shrubs on the nw. end.
16. Messerschmidtia, Cocos along the shore on the nw. side.

June 12, 1964 (August, in black)

29. Surf at Boar passage, w. end of Washington Island.
30. Beach on the w. end, Cocos and Cordia.
31. Curcurbita pepo L. - cultivated near the village.
32. Gilbertese style open school, the Nivanga anchored offshore.
33. Mirabilis jalapa L. - cultivated along the paths and beds surrounding the meeting hall.
34. View of the village on the west end - meeting house in foreground.
35. Village west end - hedges of Acalypha.
36. Dense Leucaena - waste area behind the west village.
37. Native gardens - west settlement.
38. Young fruit of Artocarpus.

Photographs:*Midway Island, May 23-25, 1964, C.R. Long.

May 23 - 24, 1964 (May, in black)

Eastern Island - May 23, 1964

2. large Casuarina growing on the west end; Verbesina, Lobularia, and Scaevola.
3. as in 2.
4. Lobularia, Scaevola, Verbesina, Casuarina; nestling black-footed albatross.
5. Anagalis, Gnaphalium on the ne. side of the ne-sw runway.
6. Black-footed albatross nestlings in Lobularia; bare nest areas.
7. Tribulus, Lobularia; west end of the e-w runway.
8. Lobularia stand; black-footed albatross nestlings; Scaevola in back; w. end of the w-e runway.
9. Scaevola - roots exposed by high waves of storm; erosion along the sw. shore of Eastern Island.
10. Along the south shore of Eastern Island; young Messerschmidtia and Casuarina.
11. Pluchea, Casuarina, Lobularia - on the n. side of the w-e runway near the intersection with the ne-sw runway.
12. Nestling black-footed albatross in Fimbristylis, Lobularia, Verbesina; at the sw. end of Eastern Island.

Sand Island, Frigate Point - May 24, 1964

13. Scaevola and Terminalia in strip parallel to and between the shore and the runway, on se. point.
14. Scaevola, Terminalia and Casuarina; in se. strip.
15. Euphorbia heterophylla under Casuarina.
16. Old bunker on se. shore; Casuarina, Cynodon.
17. Coccoloba, Setaria, young Casuarina, Boerhaavia along the se. shore.
18. Coccoloba and Casuarina trees along the se. shore.
19. Scaevola on hillocks of sand on the se. point; nestling black-footed albatross.
20. Scaevola on the se. end of the w-e runway.
21. Scaevola on the se. side of the w-e runway stabilizing and forming sand hillocks.

May 24 - 25, 1964 (May, in red)

Sand Island, Frigate Point - May 24, 1964

1. Scaevola on sand mounds; in bloom.
2. (as in 1.)
3. Litter accumulation under Scaevola.
4. Lobularia, Verbesina and Euphorbia seedlings along the Frigate Pt. road.

Eastern Island - May 25, 1964

5. Nestling black-footed albatross in Lobularia; Conyza seedlings; ne. end of the island.

* 2 x 2 Color Slides

6. Verbesina, Lobularia; south side of the w-e runway.
7. Black-footed albatross - adult and nestling - in Lobularia; s. side of the e-w runway.
8. Lobularia, Boerhaavia in old nest area; w. end of the w-e runway.
9. (as in 8.)
10. Sooty terns nesting in Lobularia and Fimbristylis; e. side.
11. Black-footed albatross nestling; Lobularia and young Scaevola at the e. end of the ne-sw runway.
12. Shore vegetation opposite the end of the ne-sw runway; young Scaevola.
13. Lobularia, Conyza, Pluchea; e. end of the ne-sw runway.
14. Lobularia, young Scaevola, Messerschmidtia; on the beach e. end of the ne-sw runway.
15. Beach at the e. end of the ne-sw runway; looking n.; note Lobularia growing in sand.
16. Scaevola, Messerschmidtia; low branches layering out into bare areas; on the e. shore; prevailing wind from the east.
17. Low Messerschmidtia shrubs on beach; e. shore.
18. Solid stand of Messerschmidtia, Scaevola; note the Lobularia on the formerly "bare" break.
19. Ipomoea in flower; on e. side.
20. Verbesina on se. end of island; nestling black-footed albatross.

May 25, 1964 (May, in black)

Eastern Island, May 25, 1964

1. Red-tailed tropicbird on egg; nest of Casuarina litter; just w of the boat dock.
2. Casuarina in back; open area with Verbesina; nestling black-footed albatross; w. end of island.
3. Open area in Casuarina grove, Lobularia; w. end.
4. Boerhaavia forming a thick mat under Casuarina and Scaevola.
5. Verbesina - thick patch on the ne. end.
6. Lobularia, Scaevola, Casuarina; ne. end.
7. Young Casuarina, Verbesina, Lobularia and Scaevola.
8. Portulaca oleracea L. and Verbesina seedlings.
9. Scaevola - Messerschmidtia association on the e. end with Casuarina.
10. Scaevola - close-up of the flower and leaves.
11. Red-tailed tropicbird nest in Casuarina litter.
12. Pluchea stand on the nw. side, w. of the e-w runway; nestling black-footed albatross in the Lobularia.
13. Pluchea stand further west along the e-w runway.
14. Blackfooted albatross nestlings in Lobularia with Scaevola in back; nw. side of e-w runway.
15. (as in 14.) - further west along the n. side of the runway.
16. (as in 14 and 15.) - further w. along the n. side of the runway.
17. At the extreme w. end of the e-w runway; Lepidium and Boerhaavia.
18. Raised coral gravel nest of black-footed albatross in Lobularia; w. end of the e-w runway.
19. Fimbristylis, Lobularia and Conyza; w. end of e-w runway.
20. Messerschmidtia, Scaevola; n. side of the e-w runway; Fimbristylis and Lobularia.
21. Northwest side of e-w runway; nestling black-footed albatross; Fimbristylis, Lobularia, Scaevola, Messerschmidtia, Casuarina.

22. Pluchea, Fimbristylis; nw. side of the e-w runway; nestling black-footed albatross.
23. Fimbristylis in bare coral gravel.
24. (as in 21.)
25. Nesting sooty terns on eggs; nw. side of the e-w runway; young Scaevola; nestling black-footed albatross.
26. Nesting sooty terns; Scaevola shrub; Casuarina and Lobularia.
27. (as in 25.) - close-up of bare nesting areas of the black-footed albatross.
28. Close-up of a black-footed albatross nestling; nw. side of the e-w runway.
29. (as in 28).
30. Coronopus, Anagalis, Lobularia; ne. side of the e-w runway.
31. Coronopus, Pluchea, Fimbristylis; mid-n. side of the e-w runway.
32. Lobularia, Pluchea, Fimbristylis; nw side of the runway.
33. Dead sooty tern on nw. end in Fimbristylis and Lobularia.
34. Many sooty tern dead; nw. side of the e-w runway; young Casuarina.
35. Long view (looking n.) of the nw. side and vegetation strip - of the e-w runway.
36. Red-tailed tropicbird nest on ground, in litter, under Scaevola.
37. Scaevola - flower and leaves close-up.

Gould

PROGRESS REPORT - ATF - June, 1964

During the month of June five islands in the Line group were visited and extensive zoological and botanical survey work was carried out. A total of 16 days were spent ashore while 14 were spent at sea.

Complete bird and mammal$ surveys were made on all islands, collections were made of birds, mammals, insects (particularly ectoparasites), plants and reptiles, extensive banding operations were carried out, blood samples were taken when possible, and rough vegetation cover maps were made. During the month of June 24,743 birds of 13 species were banded and 36 individuals of 12 species were collected.

At Sea Work

At sea watches were maintained between Pearl Harbor and Palmyra Island and between Starbuck Island and Pago Pago, American Samoa. A long-tailed Jaeger (first record for the central Pacific) and a Manx Shearwater (range extension) were collected along with three other birds. Two birds were banded at sea.

Palmyra Island

Due to restrictions in the schedule imposed by higher authorities we were unable to spend sufficient time here to make the stop worthwhile. Orientation of the scientific party and working out of operations between the ship and the S.I. party left little time for high efficiency work.

483 birds of three species were banded as outlined below.

Species	No. Banded
Red-footed Booby	474
Brown Booby	1
Common Noddy	8

Sixty blood samples were collected from Red-footed Boobies. It was impossible

to obtain variety because of the distances involved (6 miles ro nd trip on foot) or to obtain larger numbers of samples under the time limitations imposed.

12 birds of 4 species were collected. A sight record of an adult Laughing Gull is new for the island and one of the few records from the central Pacific.

Washington Island

Our stay here was extended when Bob Long was trapped ashore by high surf. Only limited ornithological work was possible from the ship during our 3 days offshore. Collections of birds were made from feeding flocks in the vicinity of the ship.

This illustrates again that ATFs are not able to deal with unfavorable surf conditions and that a party should never go ashore without adequate reserve food and water supplies. On Starbuck Island a whole day was lost when the party left a day early to avoid possible worsening surf conditions.

Bill Freus, island manager, was extremely helpful again. He provided accomodations ashore for the botonist who was suffe ring from prolonged sea-sickness and donated two rubber rafts to the party to replace the two faulty and poorly inspected ones we had brought from Pearl Harbor.

CHRISTMAS Island

During our stay here overnight visits were made to Cook Island and Motu Tabu, base camp was established on Motu Upua, and three members of the party made an 80 mile round trip on bicycles to the eastern end of the island from our base camp. As before it proved impossible to survey the entire island in detail but the general survey was more complete this trip than last.

Mr. Roberts, District Commissioner, informed us that all military personnel would be gone by June 30 and that we should have no trouble finding accomodations next trip. Only one incident between ship personnel and t e british marred our

visit and this was quickly smoothed over by the captain.

14431 bird of 10 species were banded as broken down below.

Species	Cook I	Motu Tabu	Motu Uoua	Eastern end of Christmas I.
Red-tailed TropicBird	30	19	10	---
Wedge-tailed Shearwater	--	500	500	--
Christmas I. Shearwater	--	400	2300	--
Phoenix I. Petrel	--	600	800	--
Blue-faced Booby	--	--	--	11
Red-footed Booby	--	--	71	--
Sooty Tern	5690	--	--	--
Fairy Tern	--	24	26	--
Blue-gray Noddy	--	1	--	--
Hawaiian Noddy	2700	349	400	--

12 birds of five species were collected including a Christmas Island Shearwater?? with considerable areas of white in the plumage.

Twenty species of birds were recorded for the island of which 10 and probably 13 were breeding.

Malden Island

The landing here was made under calm conditions and no trouble was experienced at any time. The S.I. party stayed in the old AEC? camp left from 1962. Because of the large size of the island considerable time was spent walking. An average days work required 15 miles of walking and on the last day part of the party covered 30 plus miles .

Birds were very scattered with almost all species and individuals nesting on islands in the central lagoon. Predation by the mammal population seemed to be the major reason for this concentration on islands.

1029 birds of 5 species were banded as broken down below.

Species	number banded
Red-tailed Tropicbird	2
Blue-faced Booby	612
Brown Booby	16
Red-footed Booby	339
Great Frigatebird	60

Seventeen species were recorded of which 10 and possibly 11 were breeding. The sight record of a Black-bellied Plover is an interesting addition to the island list.and the breeding colony of Lesser Frigatebirds further augments the data accumulated by ATF trips on this formerly little known species.

A herd of five pigs was wipedout by the S.I. party as these seemed to be a major factor in reducing the bird population. One cat was seen and remains of others were found. Near absence of tracks would seem to indicate a very small population. House mice were common everywhere on the island and several were collected.

The small reddish fish in the central lagoon reported by Bryan turned out to be brine shrimp.

Starbuck Island

Presence of large rocks in the reef makes landing in any type of surf dangerous. All members of the party recieved numerous bruises and coral cuts in the process of launching boats. Our stay was shortened when we left early to avoid being trapped by worsening surf conditions. Presence of 300-500 cats on the island has reduced the population of birds and annihilated almost everything but Sooty Terns. The mortality on the large breeding colonies of this species was about 1000 birds a night. Banding operations were somewhat hindered by the four hour round trip from camp to the nesting colonies.

8800 Sooty Terns were banded during our two nightson the island. 100-120 of birds
cats were killed and are evidently the only mammal present. Nine species were recorded of which three were nesting.

Itinerary

June 1 Departed Pearl Harbor 1800

June 2-4 At sea

June 5 Landed on Palmyra 1600

June 6-7 On Palmyra

June 8 Departed Palmyra 1500

June 9 Landed on Washington Island 1000

June 10-12 At Washington Island

June 13 Departed Washington Island 1400

June 14 Landed on Christmas Island 1400

June 15-19 On Christmas Island

June 20 Departed Christmas Island 1600

June 21 At sea

June 22 Landed on Malden Island 1400

June 23-24 On Malden

June 25 Departed Malden 0700

Landed on Starbuck 1700

June 26-27 On Starbuck

June 28 Departed Starbuck 0900

June 29-30 At sea

Second Progress Report
June-July ATF 1964

During the second 31 days of the trip 14 days were spent ashore while 17 days were spent at sea or in Pago Pago. Six islands were visited during this period and, with the exception of Hull Island, complete bird and plant surveys were made. Insect collections were made where needed to fill in previous collections and ectoparasites were collected off of as many species as possible. 409 blood samples were taken, 105 birds collected, 40333 birds banded with 3164 returns being obtained, plant collections were made on all islands and fish collections were made on three islands.

Further evidence was gained during the second half of the trip regarding the importance of cats as a limiting factor on bird distribution. In the Oct.-Nov. preliminary report it was proposed that presence of cats on an island would prevent the breeding of petrels, shearwaters, or small terns. Evidence from the last trip (Feb.-Mar.) indicated that cats in large numbers would eliminate Red-footed Boobies, Frigates and possibly Blue-faced Boobies from an island. Efforts by the Smithsonian party on Howland, Baker and Enderbury have been directed toward the complete elimination of cats on these islands. The rather immediate response of the birds to the elimination of cats has been quite surprising. On Howland, where the last cat was eliminated in February, we found two species of the shearwater-petrel group looking for nest sites or sitting on the ground and one species of small tern nesting for the first time in our experience. On Baker where the last four cats were eliminated this July we found ten nests of Blue-faced Boobies and one nest of a Red-tailed Tropicbird plus a number of Gray-backed Tern nestlings. None of these birds had been found nesting on previous visits. On Enderbury Island, where the last three

cats were killed in July, we found one species of shearwater nesting, another looking for nest sites and several species of terns nesting successfully on the main part of the island (these same terns had previously nested only on the small islands in the central lagoon). From this it seems only logical that cats are one of the major limiting factors on Gardner, Hull, Sydney, Canton, Starbuck, Malden, Jarvis and Christmas Islands and that elimination of these cats would greatly increase both the number of species and individuals using the islands as breeding sites.

Hull Island

A landing was made on the north side of the island and 42 hours were spent here by the Smithsonian party. Mr. Long (Botonist) walked about half the island. The rest of the party concentrated its efforts on the tern colony on the north side.

Eleven bird species were observed of which four were breeding. 10,500 Sooty Terns were banded, 18 were collected and 67 blood samples were taken.

Dogs, cats and rats were all present on the island. All the Gilbertese natives were evacuated in December so that there are no longer any human inhabitants on the island.

Phoenix Island.

An easy landing was made on the west side of the island and a total of 87 hours were spent ashore. A complete nest count was made of the island and a vegetation cover map was roughed out.

22 bird species were observed of which 17 were breeding. 13,500 birds of 19 species were banded with 961 returns being recorded from 11 species. This is broken down below by species.

Species	No. Banded	No. Returns
Wedge-tailed Shearwater	18	1
Christmas Is. Shearwater	400	40
Audubon's Shearwater	700	94
White-thr. Storm Petrel	33	--
Bulwer's Petrel	3	--
Red-tailed Tropicbird	92	1
Blue-faced Booby	875	797
Brown Booby	38	6
Red-footed Booby	17	9
Great Frigate	100	--
Lesser Frigate	164	--
Ruddy Turnstone	16	--
Wandering Tattler	2	--
Bristle-thighed Curlew	3	1
Gray-backed Tern	100	--
Sooty Tern	10300	9
Fairy Tern	300	--
Blue-gray Noddy	35	2
Noddy Tern	400	2

91 blood samples were taken from 6 species of birds and one species of mammal. 37 birds of 9 species were collected.

Enderbury Island

A total of 66 hours were spent ashore during which the usual complete nest counts, bird surveys and vegetation maps were made.

3734 birds of 7 species were banded with 771 returns recorded from 4 species.

Species	No. Banded	No. Returns
Wedge-tailed Shearwater	1	--
Red-tailed Tropicbird	348	67
Blue-faced Booby	319	615
Brown Booby	35	2
Red-footed Booby	431	87
Great Frigatebird	100	--
Sooty Tern	2500	--

McKean Island

Spent 46 hours ashore doing the usual bird surveys and vegetation maps. In addition, 110 blood samples were taken, 17 birds of 6 species were collected, and 9244 birds of 14 species were banded with 625 returns being recorded. 21 species were observed on the island of which 17 were banded.

Species	No. Banded.	No. Returns
Wedge-tailed Shearwater	13	4
Christmas Is. Shearwater	3	--
Audubon's Shearwater	495	44
White-thr. Storm Petrel	56	--
Bulwer's Petrel	3	--
Red-tailed Tropicbird	127	1
Blue-faced Booby	409	363

McKean Island (cont'd)

Species	No. Banded	No. Retrurns
Brown Booby	11	--
Red-footed Booby	81	44
Gray-backed Tern	100	--
Sooty Tern	7604	45
Fairy Tern	127	17
Blue-gray Noddy	200	7
Hawaiian Noddy	15	--

One of the most interesting finds was an all black storm petrel, possibly a dark phase of the White-throated Storm Petrel. If so, this would be the second species for which a dark phase has been found on this island and which has not been previously reported in the literature.

Baker Island

23 hours were spent ashore here carrying out the survey work. 12 species of birds were observed of which four were breeding (an increase of 3 in the number of breeding species over previous trips). 214 birds of three species were banded with 15 returns recorded. The absence of cats seems to be the factor responsible for the increase inbird numbers and also for the increase in the mouse population. The presence of mice had been previously known only from the remains found in a cat stomach. On this trip almost every board had a mouse hiding under it.

Species	No. Banded	No. Returns
Red-tailed Tropicbird	4	--
Blue-faced Booby	147	15
Noddy Tern	63	--

A considerable amount of time ashore was spent burning all cat hiding places and tearing apart all the old trash heaps to chase out cats. Four cats were killed and these almost certainly represented all that remained of the former large population.

Howland Island

71 hours were spent ashore doing survey work. 13 species of birds were observed of which 8 were breeding. Wedge-tailed Shearwater and Phoenix Island Petrel are new to the island and the Gray-backed Tern is a new breeding species. All of these changes are believed due to the eradication of cats during the February trip.

81 blood samples were collected, 19 birds of 4 species were collected, and 3141 birds of 7 species were banded with 792 returns.

Species	No. Banded	No. Returns
Red-tailed Tropicbird	84	4
Blue-faced Booby	491	779
Brown Booby	6	1
Red-footed Booby	77	8
Great Frigatebird	49	--
Lesser Frigatebird	33	--
Sooty Tern	2400	--

Itinerary

July 1	At sea
July 3	Landed Pago Pago, American Samoa
July 6	Departed Pago Pago, American Samoa
July 8	Arrived Hull Island
July 10	Departed Hull Island
	Arrived Phoenix Island
July 14	Departed Phoenix Island
	Arrived Enderbury Island
July 17	Departed Enderbury Island
July 18	Arrived McKean Island
July 20	Departed McKean Island
July 21	Arrived Baker Island
July 22	Departed Baker Island
	Arrived Howland Island
July 25	Departed Howland Island
July 30	Arrived Pearl Harbor

DATE 30 June 64

Time at sunrise = 0640 Position at sunrise = 163° 25'W 11° 01'S

Time at sunset = 1748 Position at sunset = 165° 27'W 12° 13'S

Miles traveled from 0000 hours to sunrise = 97

Miles traveled from sunrise to sunset = 140

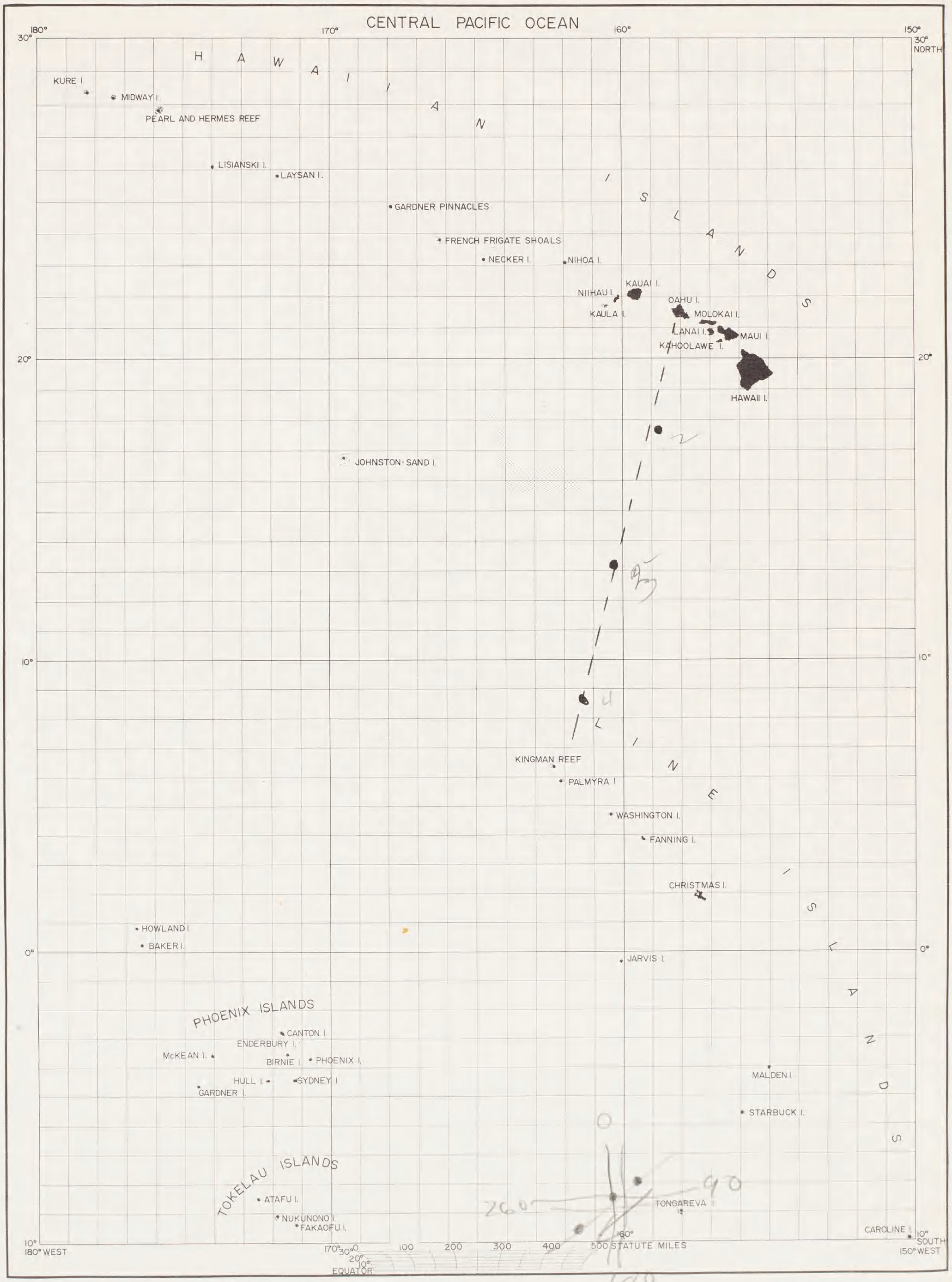
Miles traveled from sunset to 2400 hours = 100

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.	0800	celestial	163° 34.6'W	11° 09.2'S
2.	1200	"	164° 53.3'W	11° 33'S
3.	2000	"	165° 56'W	12° 36'S
4.				
5.				

ATF trip June 2-4

• - 1200 Position

CENTRAL PACIFIC OCEAN



DATE JUNE 2, 1964

Time at sunrise = 555 Position at sunrise = 19° 06'N 158° 31'W

Time at sunset = 1915 Position at sunset = 16° 00 N 159° 23'W

Miles traveled from 0000 hours to sunrise = 72

Miles traveled from sunrise to sunset = 96

Miles traveled from sunset to 2400 hours = 75

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.	0800	celestial	158°38'W	18°38'N
2.				
3.	1200	CELESTIAL	158 47.2W	17°45.2N
4.				
5.	2000	CELESTIAL	159 23.7W	15°44'N
6.				

DATE 3 JUNE 1964.

Time at sunrise = 0605 Position at sunrise = 160 02W 13°56N

Time at sunset = 1910 Position at sunset = 160 35W 11°40'N

Miles traveled from 0000 hours to sunrise = ~~45~~ 72

Miles traveled from sunrise to sunset = 155

Miles traveled from sunset to 2400 hours = 75

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.	0800	CELESTIAL	160°08W	13°52.2N
2.				
3.	1200	CELESTIAL	160 15.7W	13°05'N
4.				
5.	2000	CELESTIAL	160° 39.W	11° 22'N
6.				

DATE JUNE 4, 1964

Time at sunrise = 0600 Position at sunrise = 9° 28' N 161° 12' W

Time at sunset = 1904 Position at sunset = 7° 13' N 161° 28.5

Miles traveled from 0000 hours to sunrise = 72 mi.

Miles traveled from sunrise to sunset = 110

Miles traveled from sunset to 2400 hours = 40

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.	0800	CELESTIAL	161° 15' 0" W	9° 00' 0" N
2.	1200	"	161° 17' W	8° 41.8 N
3.	1900	"	161° 29' W	7° 26.3 N
4.				
5.				
6.				

DATE JUNE 5 1964

Time at sunrise = 0626 Position at sunrise = At Palmyra Is.

Time at sunset = 1905 Position at sunset = At Palmyra Is.

Miles traveled from 0000 hours to sunrise = 65

Miles traveled from sunset to 2400 hours = 0

Miles traveled from sunset to 2400 hours = 0

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.		At Anchor Palmyra Is.		
2.				
3.				
4.				
5.				
6.				

DATE 6 June 64

Time at sunrise = 0626 Position at sunrise = At Palmyra Is.

Time at sunset = 1906 Position at sunset = "

Miles traveled from 0000 hours to sunrise = 0

Miles traveled from sunrise to sunset = 0

Miles traveled from sunset to 2400 hours = 0

TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.	At anchor Palmyra Is.		
2.			
3.			
4.			
5.			
6.			

DATE 7 June 64

Time at sunrise = 0626 Position at sunrise = At Palmyra Is.

Time at sunset = 1906 Position at sunset = "

Miles traveled from 0000 hours to sunrise = 0

Miles traveled from sunrise to sunset = 0

Miles traveled from sunset to 2400 hours = 0

TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.			
2.	At anchor Palmyra Is.		
3.			
4.			
5.			
6.			

DATE 8 June 64

Time at sunrise = 0626 Position at sunrise = Palmyra Is.

Time at sunset = 1904 Position at sunset = 161° 43'W 05° 32'N

Miles traveled from 0000 hours to sunrise = 0

Miles traveled from sunrise to sunset = 30

Miles traveled from sunset to 2400 hours = 30

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.	2000	Visual & Radar	161° 41.6 W	5° 31' N
2.				
3.				
4.				
5.				
6.				

DATE 9 June 64

Time at sunrise = 0628 Position at sunrise = At Washington Is.

Time at sunset = 1901 Position at sunset = At Washington Is.

Miles traveled from 0000 hours to sunrise = 35

Miles traveled from sunrise to sunset = 0

Miles traveled from sunset to 2400 hours = 0

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.	~~2000~~	~~Radar + binoc~~	~~167° 30'W~~	~~4° 40.6' N~~
2.	At anchor Washington Is.			
3.				
4.				
5.				
6.				

DATE 10 June 64

Time at sunrise = 0600 Position at sunrise = Washington Is.

Time at sunset = 1901 Position at sunset = "

Miles traveled from 0000 hours to sunrise = 0

Miles traveled from sunrise to sunset = 0

Miles traveled from sunset to 2400 hours = 0

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.	~~0800~~ 1000	Radar & Visual	162° 30.1W	4° 40.6 N
2.				
3.				
4.				
5.				
6.				

DATE 11 June 64

Time at sunrise = 0628 Position at sunrise = washington Is.

Time at sunset = 1901 Position at sunset = "

Miles traveled from 0000 hours to sunrise = 0

Miles traveled from sunrise to sunset = 0

Miles traveled from sunset to 2400 hours = 0

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.	0800	Radar & Visual	160 28.6W	04° 41.5 N
2.	1200	"	160 28.4W	04 41.3 N
3.	2000	"	160 30.4W	04 46.6 N
4.				
5.				
6.				

DATE 12 June 64

Time at sunrise = 0631 Position at sunrise = Washington Is.

Time at sunset = 1852 Position at sunset = "

Miles traveled from 0000 hours to sunrise = 0

Miles traveled from sunrise to sunset = 0

Miles traveled from sunset to 2400 hours = 0

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.	0800	Radar Visual	160° 30.7'W	04° 41.3'N
2.	1200	"	160° 29.4'W	04° 44.3'N
3.	2000	"	160° 29.5'W	04° 42.9'N
4.				
5.				
6.				

DATE 13 June 64

Time at sunrise = 0631 Position at sunrise = Washington Is.

Time at sunset = 1851 Position at sunset = 159° 52'W 03° 35'N

Miles traveled from 0000 hours to sunrise = 0

Miles traveled from sunrise to sunset = 75

Miles traveled from sunset to 2400 hours = 56

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.	0800	Radar & Vis	160° 30.4'W	04° 41.7'N
2.	1200	"	160° 24.4'W	04° 44.6'N
3.	2000	"	159° 47.5'W	03° 32.5'N
4.				
5.				
6.				

DATE 14 June 64

Time at sunrise = 0625 Position at sunrise = 158° 15'W 02° 06'N

Time at sunset = 1841 Position at sunset = Christmas Is.

Miles traveled from 0000 hours to sunrise = 87

Miles traveled from sunrise to sunset = 44

Miles traveled from sunset to 2400 hours = 0

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.	0800	Celestial	157° 5'W	02° 02'N
2.				
3.				
4.				
5.				
6.				

DATE 15 June 64

Time at sunrise = 0625 Position at sunrise = Christmas Is.

Time at sunset = 1841 Position at sunset = "

Miles traveled from 0000 hours to sunrise = 0

Miles traveled from sunrise to sunset = 0

Miles traveled from sunset to 2400 hours = 0

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.		AT anchor Christmas Is.		
2.				
3.				
4.				
5.				
6.				

DATE 16 June 64

Time at sunrise = 0625 Position at sunrise = Christmas Is.

Time at sunset = 1841 Position at sunset = "

Miles traveled from 0000 hours to sunrise = 0

Miles traveled from sunrise to sunset = 0

Miles traveled from sunset to 2400 hours = 0

TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.	At anchor Christmas Is.		
2.			
3.			
4.			
5.			
6.			

DATE 17 June 64

Time at sunrise = 0625 Position at sunrise = Christmas Is.

Time at sunset = 1841 Position at sunset = "

Miles traveled from 0000 hours to sunrise = 0

Miles traveled from sunrise to sunset = 0

Miles traveled from sunset to 2400 hours = 0

TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.	At anchor Christmas Is.		
2.			
3.			
4.			
5.			
6.			

DATE 18 June 64

Time at sunrise = 0625 Position at sunrise = Christmas Is.

Time at sunset = 1841 Position at sunset = "

Miles traveled from 0000 hours to sunrise = 0

Miles traveled from sunrise to sunset = 0

Miles traveled from sunset to 2400 hours = 0

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.		At anchor Christmas Is.		
2.				
3.				
4.				
5.				
6.				

DATE 19 June 64

Time at sunrise = 0625 Position at sunrise = Christmas Is.

Time at sunset = 1841 Position at sunset = "

Miles traveled from 0000 hours to sunrise = 0

Miles traveled from sunrise to sunset = 0

Miles traveled from sunset to 2400 hours = 0

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.		At anchor Christmas Island.		
2.				
3.				
4.				
5.				
6.				

DATE 20 June 64

Time at sunrise = 0625 Position at sunrise = Christmas Is.

Time at sunset = 1841 Position at sunset = 157° 32'W 01° 34'N

Miles traveled from 0000 hours to sunrise = 0

Miles traveled from sunrise to sunset = 27

Miles traveled from sunset to 2400 hours = 47

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.	2000	Radar & Visual	157° 31.2W	1° 33.8'N
2.				
3.				
4.				
5.				
6.				

DATE 21 June 64

Time at sunrise = 0620 Position at sunrise = 156° 45'W 00° 05'S

Time at sunset = 1826 Position at sunset = 156° 14'W 01° 22'S

Miles traveled from 0000 hours to sunrise = 75

Miles traveled from sunrise to sunset = 77

Miles traveled from sunset to 2400 hours = 47

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.	0800	Celestial	156° 41.7'W	0° 20'S
2.	1200	Celestial & DR.	156° 28'W	0° 28'S
3.	2000	"	156° 13.2W	1° 36'S
4.				
5.				
6.				

DATE 22 June 64

Time at sunrise = 0620 Position at sunrise = 15°5° 28'w 03° 07's

Time at sunset = 1819 Position at sunset = Malden Is.

Miles traveled from 0000 hours to sunrise = 68

Miles traveled from sunrise to sunset = 55

Miles traveled from sunset to 2400 hours = 0

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.	0800	Celestial	155° 32'w	3° 24.5'S
2.	1200	Radar & Visual	155° 04.3w	3° 56.3 S
3.	2000	"	154° 59.6w	4° 02.5'S
4.				
5.				
6.				

DATE 23 June 64

Time at sunrise = 0633 Position at sunrise = Malden Is.

Time at sunset = 1820 Position at sunset = Malden Is.

Miles traveled from 0000 hours to sunrise = 0

Miles traveled from sunrise to sunset = 0

Miles traveled from sunset to 2400 hours = 0

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.	0800	Radar + Visual	154° 59.6w	04° 0.8'S
2.	1200	"	154° 59'w	04° 00.3S
3.	2000	"	155° 00.5'w	04° 02'S
4.				
5.				
6.				

DATE 24 June 64

Time at sunrise = 0626 Position at sunrise = Malden Is.

Time at sunset = 1831 Position at sunset = "

Miles traveled from 0000 hours to sunrise = 0

Miles traveled from sunrise to sunset = 0

Miles traveled from sunset to 2400 hours = 0

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.	0800	Radar & Visual	154° 59' W	04° 00.2' S
2.	1200	"	154° 53.7' W	04° 01.6' S
3.	2000	"	155° 01' W	04° 01.4' S
4.				
5.				
6.				

DATE 25 June 64

Time at sunrise = 0626 Position at sunrise = Malden Is.

Time at sunset = 1822 Position at sunset = Starbuck Is.

Miles traveled from 0000 hours to sunrise = 0

Miles traveled from sunrise to sunset = 104

Miles traveled from sunset to 2400 hours = 0

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.	0800	Radar & Visual	155° 05.8' W	04° 09' S
2.	1200	Celestial	155° 32' W	04° 57' S
3.	2000	Radar & Visual	155° 57.8' W	05° 35.3' S
4.				
5.				
6.				

DATE 26 June 64

Time at sunrise = 0634 Position at sunrise = Starbuck Is.

Time at sunset = 1826 Position at sunset = "

Miles traveled from 0000 hours to sunrise = 0

Miles traveled from sunrise to sunset = 0

Miles traveled from sunset to 2400 hours = 0

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.	0800	Radar & Visual	155° 58.4'W	05° 35.6'S
2.	1200	"	155° 56.7'W	05° 35.1'S
3.	2000	"	155° 57'W	05° 38.2'S
4.				
5.				
6.				

DATE 27 June 64

Time at sunrise = 0633 Position at sunrise = Starbuck Is.

Time at sunset = 1823 Position at sunset = "

Miles traveled from 0000 hours to sunrise = 0

Miles traveled from sunrise to sunset = 0

Miles traveled from sunset to 2400 hours = 0

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.	0800	Radar & Visual	155° 55.4'W	05° 39'S
2.	1200	"	155° 56.3'W	05° 37.8'S
3.	2000	"	155° 56.8'W	05° 38.7'S
4.				
5.				
6.				

DATE 28 June 64

Time at sunrise = 0623 Position at sunrise = Starbuck Is.

Time at sunset = 1823 Position at sunset = 157° 02'W 06° 23'S

Miles traveled from 0000 hours to sunrise = 0

Miles traveled from sunrise to sunset = 80

Miles traveled from sunset to 2400 hours = 62

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.	0900	Radar + Visual	157° 57.4'W	05° 38.3'S
2.	1200	"	156° 02.5'W	05° 41.0'S
3.	2000	Celestial	157° 13.2'W	06° 30'S
4.				
5.				
6.				

DATE 29 June 64

Time at sunrise = 0650 Position at sunrise = 159° 15'W 07° 54'S

Time at sunset = 1835 Position at sunset = 161° 22'W 09° 23'S

Miles traveled from 0000 hours to sunrise = 113

Miles traveled from sunrise to sunset = 153

Miles traveled from sunset to 2400 hours = 58

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.	0800	Celestial	159° 25.6'W	08° 09'S
2.	1200	D.R.	160° 10'W	08° 40'S
3.	2000	"	161° 38.6'W	09° 42.6'S
4.				
5.				
6.				